

CLAIMS:

1. A substantially pure protein having the amino acid sequence selected from the group consisting of: SEQ ID NO: 2, a mutant thereof, and a fragment thereof.

5

2. The protein of claim 1 wherein said protein has the amino acid sequence of SEQ ID NO: 2.

3. The protein of claim 1 wherein said protein has the amino acid sequence of a fragment of SEQ ID NO: 2.

10

4. An isolated nucleic acid molecule that comprises a nucleic acid sequence that encodes the protein of claim 1.

15

5. A recombinant expression vector comprising the nucleic acid molecule of claim 4.

6. A host cell comprising the recombinant expression vector of claim 5.

20

7. An isolated nucleic acid molecule that comprises a nucleic acid sequence that encodes the protein of claim 2.

8. A recombinant expression vector comprising the nucleic acid molecule of claim 7.

25

9. A host cell comprising the recombinant expression vector of claim 8.

10. An isolated nucleic acid molecule having a nucleic acid sequence selected from the group consisting of: SEQ ID NO: 1 and a fragment thereof having at least 10 nucleotides.

30

11. The isolated nucleic acid molecule of claim 10, wherein the nucleic acid sequence is SEQ ID NO: 1.

5 12. A recombinant expression vector comprising the nucleic acid molecule of claim 11.

13. A host cell comprising the recombinant expression vector of claim 12.

10 14. An isolated antibody which binds to an epitope on SEQ ID NO: 2.

15. A method of identifying a modulator of a *Hemipteran* glutamate decarboxylase protein activity comprising the steps of:

15 contacting the amino acid sequence of the invention, or a host cell or host organism containing or expressing an amino acid sequence, with a test chemical, in such a way that a signal may be generated that is representative for the interaction between said test chemical and said target; and optionally
detecting the signal that may thus be generated, said signal identifying the modulator of said amino acid sequence.

20

16. The method of claim 15 wherein said *Hemipteran* glutamate decarboxylase protein has an amino acid sequence selected from the group consisting of: SEQ ID NO: 2, a mutant thereof, and a fragment thereof.

25 17. The method of claim 16 wherein said *Hemipteran* glutamate decarboxylase protein has an amino acid sequence of SEQ ID NO: 2.

18. A method of identifying an inhibitor of a *Hemipteran* glutamate decarboxylase protein activity comprising the steps of:

30 contacting the amino acid sequence of the invention, or a host cell or host organism

containing or expressing an amino acid sequence, with a test chemical, in such a way that a signal may be generated that is representative for the interaction between said test chemical and said target; and optionally

5 detecting the signal that may thus be generated, said signal identifying the inhibitor of said amino acid sequence.

10 19. The method of claim 18 wherein said *Hemipteran* glutamate decarboxylase protein has an amino acid sequence selected from the group consisting of: SEQ ID NO: 2, a mutant thereof, and a fragment thereof.

20. The method of claim 19 wherein said *Hemipteran* glutamate decarboxylase protein has an amino acid is SEQ ID NO: 2.

15 21. A method of preparing an isolated protein having the amino acid sequence selected from the group consisting of: SEQ ID NO:2, a mutant thereof, and a fragment thereof comprising the step of isolating said protein from a host cell of claim 6.

20 22. A method of controlling an insect, comprising contacting the insect with the modulator of glutamate decarboxylase.

23. The method of claim 22 wherein the insect is a *Hemipteran insect* and the glutamate decarboxylase is a *Hemipteran* glutamate decarboxylase.

25 24. The method of claim 23 wherein the is *Hemipteran* glutamate decarboxylase has an amino acid sequence comprising SEQ ID NO:2.

25 25. The method of claim 23 wherein the is *Hemipteran* glutamate decarboxylase is encoded by a nucleic acid sequence comprising SEQ ID NO:1.